Species of Concern
NOAA National Marine Fisheries Service

Ivory tree coral
Oculina varicosa

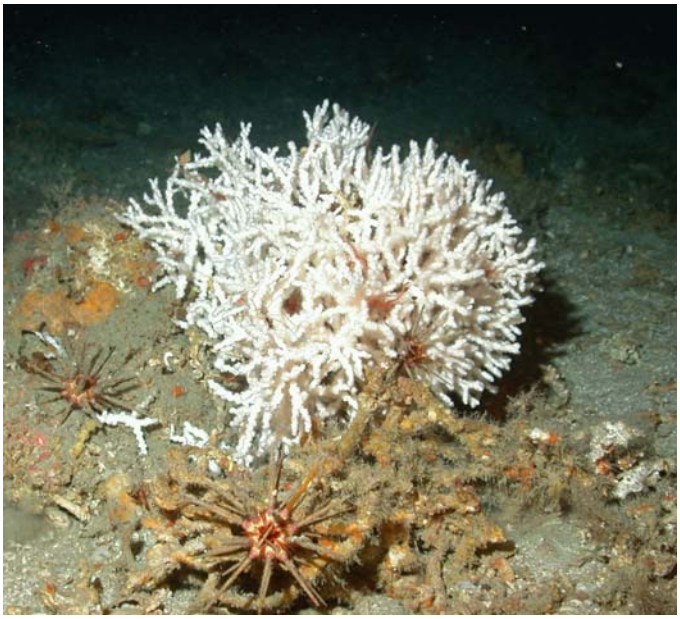

Photo credit: NMFS.

KEY INFORMATION

Areas of Concern
Oculina Banks (east Florida).

Year Identified as "Species of Concern"
1991

Factors for Decline
- Habitat destruction from fishing gear
- Habitat modification

Conservation Designations
IUCN: Not Evaluated

Current Status:

Demographic and Genetic Diversity Concerns:
"Species of Concern" listing rationale is based on well-documented declines in the Oculina Banks area. The Banks were first observed and described in the late 1970s (Reed 1980). Over 50 sites were identified that had low-density populations of *Oculina*, while 14 sites had extensive thickets of contiguous and 5 sites were high-relief bioherms. Extensive submersible and ROV surveys from 1995 to 2005 indicated that extensive habitat damage existed throughout the area, and only two sites (Jeff's Reef and Chapman's Reef) still contained extensive thickets (Koenig et al. 2005, Reed et al. 2005). This documented species decline is coupled with an apparent low level of sexual recruitment in the Oculina Banks habitat. Asexual fragmentation may provide for the establishment of some new colonies but habitat alteration from repeated trawl damage prevents the coral recruits from successfully settling on the coral rubble substrate. Little information is available concerning *O. varicosa* population status and trends in other areas. Accumulating genetic evidence suggests the the Oculina Banks populations are demographically isolated from all other U.S. populations of *Oculina*, showing a sharp genetic break with shallow water populations nearby that is far greater than differences seen among shallow water populations of *Oculina* (even those presently with different names) sampled from North Carolina to the Florida Panhandle.

Existing Protections and Conservation Actions:
In 1984, the South Atlantic Fishery Management Council established the 122 mi^2 (315 km^2) Oculina Habitat Area of Particular Concern (HAPC), the world's first protection granted specifically to a deep coral habitat. In 2000 the South Atlantic Council expanded the Oculina HAPC to 397 mi^2 (1029 km^2) and prevented trawling in the area. The South Atlantic Council is currently reviewing and evaluating options for gear regulations and new coral HAPCs to protect four very large deep coral habitats as part of a Comprehensive Fishery Ecosystem Plan Amendment

Brief Species Description:
Oculina varicosa ranges from Cape Hatteras, North Carolina through the Gulf of Mexico and Caribbean, though the main population of concern is off east-central Florida where it forms unique deep and shallow growth forms. The deep-water growth form has been found in depths of 49-152 m

ranging from Florida to North Carolina of the southeastern United States. The high relief Oculina Banks, however, are only known off central eastern Florida. The shallow water form is known from Bermuda to the West Indies and Gulf of Mexico. Colonies are arborescent, with highly clumped, irregular bushy branches; branches average one-fourth inch (6 mm) in diameter and colonies can be 4 to 5 feet (1.5 m) tall. Corallites are distributed in a spiral around the branches, and each corallite is approximately 0.1 inch (2-3 mm) in diameter. Deep water colonies are white in color and have thinly tapered branches with widely spaced corallites. The deep growth form (> 200 feet or 60 m) does not have symbiotic algae (zooxanthellae). Shallow water colonies are golden to brown due to symbiotic algae, and have shorter, stout branches with closely-spaced corallites. Shallow colonies differ anatomically in being stouter, shorter, and producing thicker branches. Colonies are semi-isolated, patchy and low-growing (<1 ft) in shallow water. The deeper individuals have a growth rate that is about 50% faster than shallow individuals (Reed 1981).

Oculina suspension-feed on planktonic organisms. Over 300 species of invertebrates have been found living in the branches of *O. varicosa* (Reed 2002), so it serves as an important keystone species and habitat. Koenig (2001) found a relationship between the abundance of economically valuable fishes (e.g., grouper, snapper, sea bass, amberjack) and the condition (dead, sparse, and intact) of *Oculina* coral. These *Oculina* coral reefs off Florida have been identified as essential fish habitat for Federally-managed species. The species reproduces sexually by broadcast spawning. Spawning is believed to occur during July and August in the shallow populations, and during September in the deep populations, with no obvious relationship to lunar or tidal phase. Larvae settle after about three weeks in laboratory conditions. Though the taxonomy of the *Oculina* genus is unclear, recent genetic studies are providing mounting evidence that the deep-water form that occupies the Oculina Banks is substantially distinct from nearby shallow (3m to 30m) populations.

Status Reviews/Research Underway:

The South Atlantic Fishery Management Council has published an Evaluation Plan (http://www.safmc.net/Portals/0/Oculina/OECAEvaluationPlan.pdf) for the Oculina Banks Experimental Closed Area. A series of experimental restoration structures was deployed in the Oculina Banks area between 1996 and 2001 and evaluation is carried out opportunistically. Other research is focusing on clarifying the uncertain taxonomy of this species. Additional nuclear genetic markers are being developed as a means to more precisely define species boundaries within *Oculina*. Monitoring of the Oculina Banks Experimental Research Reserve is sporadic; mapping is ongoing.

Contact Information

For *Oculina*, contact:

Dr. Margaret Miller
NOAA Fisheries,
Southeast Science Center
75 Virginia Beach Dr.
Miami, FL 33149
(305) 361-4200

Margaret.W.Miller@noaa.gov

For Species of Concern, contact

NOAA Fisheries
Office of Protected Resources
1315 East West Highway
Silver Spring, MD 20910
(301) 713-1401

soc.list@noaa.gov

http://www.nmfs.noaa.gov/pr/species/concern

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